AMENDMENT TO THE SPECIFICATION

Please replace the paragraph beginning on page 4, line 23 with the following amended paragraph:

Referring now to the drawings wherein the showings are for purposes of illustrating a preferred embodiment of the invention only and not for purposes of limiting the same, FIGS. 1 and 12 show vehicles 1 that are equipped with an electronic control system in accordance with this invention. More specifically in a first embodiment, shown primarily in FIGS. [[1-11[[1, 1A, and 8-10, the vehicle 1 is a lawn tractor 10 and in a second embodiment, shown primarily in FIGS. [[12-25]] 12-18, the vehicle 1 is a utility vehicle 150. As is well known in the art, a utility vehicle is a type of off road vehicle that may be used for many different off-road purposes. For example the utility vehicle 150 shown in FIG. 12 contains a loading bed 152 that can be used to transport materials such as dirt, gravel, mulch, etc. Other types of utility vehicles (not shown) may have a flat loading bed that are used to transport other types of materials such as logs, railroad ties, landscape ties, etc. Still further the utility vehicle may be equipped with either a front or rear attachment used for plowing, raking, mowing, aerating, etc. It should be noted that the present invention can be used on either vehicle described above. It should be further noted that the present invention is not limited to the types of vehicles shown but is preferred to be used with an off the road vehicle such as other types of tractors, mowers, other vehicles and other applications as well.

Please replace the paragraph beginning on page 6, line 7 with the following amended paragraph:

With continuing reference to FIGS. 8, 9, and 10, the second belt system operatively connects the variator 84 to an input pulley 88 via a driven belt [[90]] 104. The input pulley 88 is rotatably connected to the transmission input shaft 92 and thus to the transmission 22. Preferably, but optionally, the second belt system includes an idler pulley (not shown) that may be spring-biased to maintain proper belt tension in the

second belt system. The variator 84 consists of two variable effective diameter pulleys, an upper pulley 94 and a lower pulley 96. The upper 94 and lower 96 pulleys share a common inner pulley member referred to as a slidable central disk 98. The disk 98 is selectively slidable in the axial direction between the outer sides (top and bottom as shown) of the variator 84 thereby selectively varying the diameter of both the upper 94 and lower 96 pulleys. In other words, when the disk 98 slides toward the top 100 of the variator 84 the effective diameter of the upper pulley 94 increases and the effective diameter of the lower pulley 96 decreases. The reverse takes place as the disk 98 slides toward the bottom 102 of the variator 84. When the operator starts the engine 14 the drive pulley 82, which is operatively connected to the engine 14, may rotate at a speed of approximately 400 rotations per minute. However, until the operator presses an accelerator pedal 21 there is no tension on the drive belt 86. Therefore, the drive belt 86 is not rotating and thus the tractor 10 is not moving. The drive belt 86 is connected to the drive pulley 82, the idler pulley (not shown) and the lower pulley 96 of the variator 84. When the operator presses the accelerator pedal 21 the idler pulley is physically moved such that tension is created in the drive belt 86. As the tension increases in the drive belt 86, the drive pulley 82 engages the variator 84 such that the variator is rotated. The rotation of the variator 84 in turn drives the input pulley 88 via the driven belt 104 (which is connected to the upper pulley 94 of the variator 84). The input pulley 88 in turn drives the transmission input shaft 92 thereby engaging the transmission 22 and propelling the vehicle 1 in the forward or reverse direction. As the operator further depresses the accelerator pedal 21 the displacement of the idler pulley increases thereby increasing the tension on the drive belt 86, which in turn increases the speed of the vehicle 1. FIG. 10 also illustrates the location of the vacuum actuator 20, with respect to the drive system 80 and transmission 22.

Please replace the paragraph beginning on page 9, line 25 with the following amended paragraph:

Still referring to FIGS. 2 and 4 the operation of the control circuit 32 will now be described. While the operator is sitting on the vehicle 1, in order to move the vehicle 1 in

the forward direction, the operator activates the forward switch 33 by depressing the forward push button 72, 158 as described above. The control mechanism 166, shown in FIG. 23, sends a signal to the forward switch 33 thereby closing the switch 33 and activating the circuit. By closing the forward switch 33, an electric signal is sent to the relay 44 thereby energizing the relay 44. The relay 44 closes thus completing the circuit and allowing power to flow to the solenoid 36, thereby energizing the solenoid 36. Once the solenoid 36 is energized, the solenoid 36 opens and allows air to flow from the vacuum actuator 20 to the vacuum means 155, thereby creating a vacuum in the first vacuum compartment 28. As the vacuum forms in the first vacuum compartment 28, the internal membrane of the vacuum actuator 20 moves in the first direction 29 and pushes on the actuator rod 66. The actuator rod 66 shifts the gears of the transmission 22 to allow the vehicle 1 to move in the forward direction. At this time an indicator light 48 is also energized to inform the operator that the forward circuit is energized. Once the transmission 22 has shifted gears and the vehicle is moving in the forward direction, the shift pin 70 (FIG. 6) contacts and activates the cut off switch 40. The cut off switch 40 is opened and interrupts the circuit thereby de-energizing the solenoid 36. As the solenoid 36 closes it stops the airflow from the vacuum actuator 20 to the vacuum means 155 thereby diminishing the vacuum in the vacuum actuator 20. As the vacuum diminishes the internal membrane of the vacuum actuator 20 moves in the second direction 31 back to its original position. It should be noted that when the cut off switch 40 is activated and opens the solenoid 36 thereby diminishing the vacuum within the vacuum actuator 20, the vehicle 1 still continues to move in the forward direction as long as the operator continues to activate the forward switch 33. The operator can deactivate the forward switch 33 by either depressing the brake 106 as shown in FIGS. 1A and 14 or depressing the neutral push button 160 as shown in FIG. 15. Once the operator deactivates the forward switch 33 the vehicle 1 will cease to move in the forward direction. To operate the vehicle 1 in the reverse direction the same electrical and mechanical sequence previously described is performed with the reverse switch 34, the cut off switch 42, the relay 46 and the second solenoid 38. The only difference is that in order to move the

vehicle 1 in the reverse direction the operator must activate the reverse push button 162 as shown in FIG. 15 to activate the reverse switch 34.

Please replace the paragraph beginning on page 11, line 23 with the following amended paragraph:

Referring to FIGS. 18-22, the sensing mechanism 187 further consists of a sensor 188, and a sensor detector 190. In the preferred embodiment the sensor 188 is a ball switch [[189]]. However, it should be noted that the sensor can be any type of sensor chosen with sound engineering judgment. The ball switch sensor [[189]] 188 further consists of a ball 191, a housing 192 and a contact or relay (not shown) located inside the housing [[191]] 192. As will be explained below, the sensor 188 sends a neutral or not neutral signal to the shift module 168. As shown in FIG. 19, the sensor detector [[187]] 190 is operatively connected to the transmission 22. In the preferred embodiment the sensor detector [[187]] 190 is triangular in shape that includes an arcuate portion 193 at the bottom and a notch 197 that is centrally located within the arcuate portion 193. It should be noted that the sensing detector [[187]] 190 can be any shape chosen with sound engineering judgment. Located at the top of the sensor detector [[187]] 190 is a rounded hub 194. The hub 194 further includes an aperture 196 to receive the transmission rod 195. As will be explained below, the transmission rod 195 is operatively connected to the transmission 22 and ultimately shifts the transmission 22 between forward, reverse and neutral. Also connected to the sensing mechanism 187 is the actuator rod 66. As previously explained the actuator rod 66 is operatively connected to the vacuum actuator 20.

Please replace the paragraph beginning on page 12, line 11 with the following amended four paragraphs:

Referring to FIGS. [[14-24]] 18-24, operation of the shift module 168 and the sensing mechanism 187 will now be described. At the start of operation of the vehicle 1, the sensing mechanism 187 is in the neutral state as shown in FIG. 19. When the operator attempts starts the engine 14 the sensor 188 sends a neutral signal to the shift module 168

that tells the shift module 168 that the vehicle 1 is in neutral. If the shift module 168 does not receive a neutral signal from the sensor 188 the shift module will not permit the vehicle 1 to start. When the operator depresses the forward push button 158 (FIG. 15) or 72 (FIG. 11), a forward input signal is sent to the shift module 168. The shift module 168 then sends a signal to the control circuit 32 which in turn activates the vacuum actuator 20 as described above. The internal membrane (not shown) of the vacuum actuator 20 pushes the actuator rod 66 in a first direction 29. The actuator rod 66 in turn pushes on the sensor detector 190 causing the sensing detector 190 to pivot about the radial axis of the aperture 196 as shown in FIG. 21. This in turn causes the transmission rod 195 to rotate thereby shifting the transmission 22 to the forward direction. In addition, as the sensor detector 190 rotates the arcuate portion 193 contacts the ball 191 on the ball switch sensor 188 [[189]] and pushes the ball 191 into the housing 192. As the ball 191 descends into the housing 192 it contacts the relay or contact (not shown) and closes an electrical circuit that sends a signal to the shift module 168 informing the shift module 168 that the vehicle 1 is no longer in neutral. Therefore, the controller (not shown) located in the shift module 168 now senses that the vehicle is in forward because the shift module received two input signals; 1) a forward input signal from the operator and, 2) a not neutral input signal from the sensor 188. The combination of these two signals tells the controller that the vehicle 1 is in forward. Furthermore, the vacuum actuator 20 will remain energized in the first direction 29 until the operator activates another activating means 71 such as the reverse 162 or neutral 160 pushbuttons.

Now when the operator depresses the reverse push button 162, the internal membrane of the vacuum actuator 20 pulls the actuator rod 66 in a second direction 31 as explained above. The actuator rod 66 in turn pulls the sensor detector 190 causing the sensing detector 190 to pivot in the second direction 31 about the radial axis of the aperture 196. As the sensor detector 190 pivots, the ball 191 disengages from the arcuate portion 193 as it reaches the notch 197. As the ball reaches the notch 197 the ball 191 will ascend in the housing 192 thereby disengaging itself from the contact or relay. This will in turn send a signal to the controller informing the shift module 168 that the transmission 22 is in neutral. After the neutral signal is received by the shift module 168,

the shift module will send a signal to the control circuit 32 to continue with the shifting process to reverse. This process causes the transmission rod 195 to rotate thereby shifting the transmission 22 to the reverse direction. If the neutral signal is not received by the shift module 168 the shift module will still permit the transmission 22 to shift into reverse, however a fault code will be generated informing the operator that there may be a problem with the sensing mechanism 187 because the sensor 188 did not sense neutral within a predetermined period of time. Therefore, the controller (not shown) located in the shift module 168 now senses that the vehicle is in reverse because the shift module received two input signals; 1) a reverse input signal from the operator and, 2) a neutral input signal from the sensor 188. The combination of these two signals tells the controller that the vehicle is in reverse. Furthermore, the vacuum actuator 20 will remain energized in the second direction 31 until the operator activates another activating means 71 such as the forward 158 or neutral 160 pushbuttons. In addition, when the shift module 168 verifies that the vehicle 1 is in reverse an audible device 199 will generate an audible signal indicating that the vehicle 1 is in reverse.

In order to shift the vehicle 1 into neutral the operator depresses the neutral button 160 which in turn sends an input signal the shift module 168. The shift module 168 then sends a signal to the control circuit 32 which in turn activates the vacuum actuator 20 as described above. The internal membrane (not shown) of the vacuum actuator 20 either pushes or pulls the actuator rod 66 in [[a]] the first 29 or second direction 31 respectively, depending if the transmission 22 is in forward or reverse. The actuator rod 66 in turn pushes or pulls the sensor detector 190 causing the sensing detector 190 to pivot about the radial axis of the aperture 196 as shown in FIG. 21. As the sensor detector 190 pivots the ball 191 disengages from the arcuate portion 193 as it reaches the notch 197. As the ball reaches the notch 197, the ball 191 will ascend in the housing 192 thereby disengaging itself from the contact or relay. The sensor 188 then sends a signal to the controller informing the shift module 168 that the transmission 22 is in neutral. Because the shift module 168 received two neutral signals, one from the operator and one from the sensor 188, the shift module will sense that the vehicle 1 is in neutral and send an output signal to the actuator 20 to discontinue movement. Therefore, the controller (not shown)

located in the shift module 168 now senses that the vehicle is in neutral because the shift module received two input signals; 1) a neutral input signal from the operator and, 2) a neutral input signal from the sensor 188.

The shift module 168 also employs a self-correcting feature whereupon when shifting to the neutral position, the shift module 168 will continue to verify that the vehicle 1 is in neutral until another input is received from the operator or the vehicle 1 is powered down. This feature permits the shift module 168 to insure that the transmission 22 is in neutral in the event that an over-shift occurs. In other words, if the sensor detector 190 goes past neutral the shift module 168 will send the appropriate signal to the control circuit 32 to bring the sensor detector 190 back to the neutral position. It should be noted that the operator must first depress the brake 106 prior to any shifting operation. In other words, the control mechanism 166 must first sense an input from the brake 106 before it will shift the transmission 22. If the operator fails to depress the brake 106 prior to shifting, the control mechanism 166 will look for an input signal from the brake 106. If no input signal is received, the control mechanism 166 will not perform any function, therefore, the vehicle 1 will remain in its present state. When the operator wants to power down the vehicle 1, the operator depresses the neutral pushbutton 160 to return the transmission 22 to neutral as described above and then turns the key to the off position. However, if the operator does not activate the neutral pushbutton 160 prior to turning the key to the off position and the vehicle 1 is in forward, reverse, or in a fault condition, the engine will shut off immediately but the shift module 168 will send a signal to the control circuit 32 to shift the transmission 22 to the neutral position prior to powering down the electronic components of the vehicle 1. During the power down operation the shift module 168 also controls a power-down latching relay 198 (FIG. 25). Once the shift module 168 verifies that the vehicle 1 is in neutral, the shift module 168 will open the power-down latching relay 198 thereby powering down the electronic components of the vehicle 1.